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SCHOOL CURRICULUM TRAINING ANALYSIS AND EVALUATION  
GROUP (NAVY) ORLANDO FL J W LOSA ET AL. FEB 83

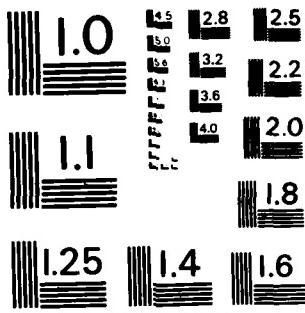
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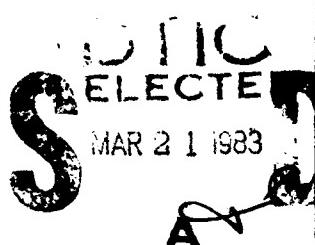
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TECHNICAL MEMORANDUM 83-2

(12)

**READABILITY GRADE LEVELS  
OF SELECTED NAVY  
TECHNICAL SCHOOL CURRICULA**

FEBRUARY 1983



Technical Memorandum 83-2

READABILITY GRADE LEVELS OF SELECTED  
NAVY TECHNICAL SCHOOL CURRICULA

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February 1983

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br><b>The curriculums of 11 Navy technical schools were surveyed for readability. Samples from courses with high throughput, academic attrition, and setback rates were analyzed using the Computer Readability Editing System (CRES). Results showed a moderately high correlation between readability grade level and setback rates (<math>r = .49</math>). Schools which embody high technology (such as Electronics Technician <del>P&amp;R</del> School and Advanced First Term Avionics) showed both high readability and high setback rates.</b> |  |   |

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Mean readability grade levels ranged from 12.6 for the Electronics Technician "A" School down to 8.1 for the Machinery Repairman "A" School.

This study supports requirements set forth in OPNAV Instruction 1510.11, "Enlisted Fundamental Skills Training," to help the Chief of Naval Education and Training plan for appropriate fundamental skills training interventions to upgrade basic competencies in support of military operations.

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## SECTION I

### INTRODUCTION

Many sailors entering "A" schools lack the reading skills to cope successfully with school reading materials. For example, at the Operations Specialist "A" School, Dam Neck, Virginia, more than 1,000 students per year require remedial reading instruction.<sup>1</sup> In addition, the Chief of Naval Operations has stated that a "substantial proportion of recruits read below the 10th grade level. Academic Remedial Training programs at the Recruit Training Commands and the Job Oriented Basic Skills program are limited in scope and cannot overcome the entire Navy (reading) problem which has its roots in our public educational system. This situation is projected to become more critical as we face the declining manpower pool of the 1980's."<sup>2</sup>

According to the most recent Navy figures, 25 percent of entering Navy recruits read at or below the ninth grade level.<sup>3</sup> An initiative addressing the need to improve reading skills of enlisted personnel is contained in OPNAV Instruction 1510.11.<sup>4</sup> The instruction establishes a policy of providing "appropriate fundamental skills training interventions to upgrade basic competencies<sup>5</sup> in support of military operations." The instruction further states that the Chief of Naval Education and Training (CNET) has the responsibility to: (1) design and implement training programs to achieve competency goals identified for Navy training courses and (2) determine the skills needed to comprehend technical information. Because of the long-term involvement of the TAEG with the basic skills program of the NAVEDTRACOM (e.g., Kincaid and Curry, 1979; Aagard, Pereyra, and Kincaid, 1981; Brown, 1982), the CNET tasked the TAEG to determine the readability grade levels of selected "A" school course reading materials.<sup>6,7</sup> As part of the tasking for this study, TAEG completed an assessment of the readability level of essential job reading material for nonrated Navy personnel (Hamel, Aagard, and Kincaid, 1982).

### PURPOSE

The purpose of the present study was to determine the readability grade levels (RGL) of materials used in the curricula of selected "A" schools (those with high throughput and/or attrition) as a basis for: (1) establishing minimal reading competencies for those schools, (2) identifying problem textual materials used in these schools, and (3) choosing additional school curricula for readability analysis.

<sup>1</sup>NAVSWC 031507Z Aug 1982

<sup>2</sup>CNO ltr 204564 of 21 Apr 1980

<sup>3</sup>CMI Recruit Population Analysis Report produced by the Management Information and Instructional Systems Activity (MIISA)

<sup>4</sup>OPNAVINST 1510.11, Enlisted Fundamental Skills Training

<sup>5</sup>Basic competencies include not only reading but also mathematics and communications skills

<sup>6</sup>CNET ltr of 13 July 1981

<sup>7</sup>Advanced First Term Avionics, a post-"A" School, was also included in the study

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**ORGANIZATION OF THE REPORT**

In addition to this introduction, the report contains three additional sections and two appendices. Section II presents the approach used in the readability grade level analysis and the rationale for selecting the particular schools. Section III contains the study results. Section IV presents the conclusions and recommendations. Appendix A is a list of the sampled reading materials, with readability grade levels. Appendix B contains an example for one school of technical words, identified by the computer readability analysis not ordinarily in the vocabulary of beginning students. Such lists should prove useful for developing vocabulary instructional materials for students entering Navy technical schools.

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### SECTION II

#### APPROACH

This section describes the approach taken in: (1) selecting courses in which difficult reading material might be a problem and (2) conducting the readability analysis.

#### SELECTION OF COURSES

Resources permitted the study of only a limited number of school curricula so a technique for prioritizing schools most likely to benefit from a readability analysis was required. The priorities established in selecting schools for this study were based on three criteria: (1) annual throughput, (2) percent of students set back, and (3) percent of students attriting for academic reasons.

Table 1 shows the schools selected and data for the three selection criteria for the year ending 31 August 1982. Annual throughput varied considerably ranging from 3,247 for Avionics "A" School to 78 for Mineman "A" School. All selected schools experienced a high rate of setback (ranging from 16 percent to 88 percent) and most experienced a high rate of academic attrition (8 out of 11 had 10 percent or greater).

#### READABILITY ANALYSIS

Instructional personnel of the schools (either an education specialist or the officer in charge) selected course material for analysis which they judged to be most important in the curriculum. TAEG was also furnished a curriculum guide to determine the appropriate pages for analysis. These materials were then sampled according to the DOD specification dealing with readability (MIL-M-38784A, Amendment 6, Department of Defense, 1982). For some of the schools (AV, AE, AFTA, and AW located at NAS Memphis) materials were collected by a TAEG representative. At the other schools, materials were sent after one or more telephone conversations. In all cases, TAEG personnel contacted school personnel knowledgeable about the school's curriculum to verify that the selected materials were the most important ones for their course.

MIL-M-38784A, Amendment 6, prescribes a technique for determining the readability of course materials and a technique for sampling materials for the analysis. For a document containing 100 or more pages of textual material, 10 samples of approximately 200 words are selected and a readability grade level is obtained using the Flesch-Kincaid readability formula (Kincaid, Fishburne, Rogers, and Chissom, 1975). This formula has two factors: (1) sentence length in words and (2) word length in syllables. It provides grade level according to the formula:

$$\text{Grade level} = 0.39 (\text{Average No. Words/Sentence}) + 11.8 (\text{Average No. Syllables/Word}) - 15.59.$$

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TABLE 1. ANNUAL THROUGHPUT, PERCENT SETBACK, AND PERCENT ACADEMIC ATTRITION FOR SELECTED SCHOOLS\*

| Course Title                                 | Annual Throughput | Setback % | Attrition % |
|--|-------------------|-----------|-------------|
| Avionics (AV)                                | 3,247             | 16        | 11          |
| Electronics Technician (ET)                  | 2,275             | 88        | 25          |
| Aviation Electrician's Mate (AE)             | 1,672             | 34        | 7           |
| Advanced First Term Avionics (AFTA)          | 761               | 39        | 4           |
| Air Traffic Controller (AC)                  | 745               | 33        | 38          |
| Data Systems Technician (DS)                 | 635               | 18        | 8           |
| Aviation Antisubmarine Warfare Operator (AW) | 558               | 37        | 10          |
| Machinery Repairman (MR)                     | 391               | 25        | 11          |
| Strategic Weapons Systems Electronics (SWSE) | 357               | 57        | 32          |
| Aerographer's Mate (AG)                      | 226               | 35        | 16          |
| Mineman (MN)                                 | 78                | 27        | 11          |

\*For year ending 31 August 1982. Data provided by CNET, Code N-2.

The obtained readability grade level corresponds to the grade level of reading ability required to understand the text. For example, a person reading at the 10th grade level should have full comprehension of a document written at the 10th grade readability level.

The readability analyses were obtained using the Computer Readability Editing System (CRES) described in TAE Report 83 (Kincaid, Aagard, and O'Hara, 1980). TAE has used the CRES for readability analysis of the Surface Warfare Officers School curriculum (Aagard, et al., 1981) and for essential reading material for enlisted personnel (Hamel, et al., 1982). As in these studies, samples of text were keyed into the computer (or read in if available in machine-readable form), and the readability grade levels were automatically obtained. The CRES also flags words not in a core vocabulary representing words a Navy trainee should know. These flagged words can be useful in identifying technical words (see appendix B) for glossaries for training students entering the particular "A" school.

## SECTION III

## RESULTS

Table 2 summarizes the average readability grade levels, setback rates, and attrition rates for the courses surveyed in this study. The data are presented in descending order of the mean readability grade level. The Electronics Technician curriculum was found to be the most difficult readability grade level, 12.6, which is above college level. The second most difficult course, Advanced Electronics, was found to have a mean readability grade level of 10.4, which is below college courses. The least difficult course, Mail Room Clerk, was found to have a readability grade level of 8.1. Although mean readability grade level is an important overall measure, the upper range of readability grade levels should be stressed when considering the trainee's ability to comprehend material. For instance, one very difficult publication in the Electronics curriculum might be very troublesome even for those whose reading ability matches the mean readability grade level of the course material.

Measures of academic difficulty shown in table 2 include percentages of academic setback and academic attrition. It is interesting to note that the course with the highest RGL, Electronics Technician, also had the highest percentage of setbacks and the third highest percentage of academic attrition of the 11 courses included in this study. Correlations were computed to assess the strength of the relationship between RGL and measures of academic difficulty. The correlation between mean readability grade level and percentage of setbacks was  $r = .49$ . This is considered a moderately high correlation although statistically not significant.<sup>8</sup> The correlation between readability grade level and percentage of academic attrition was found to be  $r = .09$ . This low correlation indicates little relationship between the two variables.

Table 3 shows recent data (FY 82) for the reading ability of Navy recruits. All recruits were tested using level D of the Gates-McGinitie Reading Test (MacGinitie, 1978). Thirty-two percent of recruits were shown to have college level reading (above a grade level of 12.0). Recruits with this reading proficiency should not experience difficulty with the reading materials encountered in any of the schools surveyed in this study. Forty-eight percent of recruits were shown to have reading abilities between the 8th and 12th grade levels. The reading ability of this group would permit them to comprehend only part of the reading materials surveyed in this study. Twenty percent of recruits showed reading abilities at or below the eighth grade level. These recruits would have difficulty in comprehending text in any of the schools surveyed.

<sup>8</sup>Probability of obtaining a correlation of .49 ( $n=11$ ) by chance is 19 percent. Conventionally, a probability of 5 percent is considered statistically significant.

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TABLE 2. MEAN READABILITY GRADE LEVELS (RGL), SETBACK RATES, AND ACADEMIC ATTRITION PERCENTAGES FOR SELECTED SCHOOLS

| Course Title                                 | Mean RGL   | RGL Range | Setback %* | Attrition %* |
|--|------------|-----------|------------|--------------|
| Electronics Technician (ET)                  | 12.6       | 11.9-13.0 | 88         | 25           |
| Advanced First Term Avionics (AFTA)          | 11.9       | 11.7-12.0 | 39         | 4            |
| Mineman (MN)                                 | 11.3       | 9.1-14.4  | 27         | 11           |
| Avionics (AV)                                | 11.0       | 10.8-11.3 | 16         | 11           |
| Air Traffic Controller (AC)                  | 10.9       | 6.6-15.9  | 33         | 38           |
| Aviation Antisubmarine Warfare Operator (AW) | 10.6       | 9.4-12.1  | 37         | 10           |
| Aviation Electronics Mate (AE)               | 10.3       | 6.4-12.4  | 34         | 7            |
| Aerographer's Mate (AG)                      | 10.0       | 6.7-11.8  | 35         | 16           |
| Data Systems Technician (DS)                 | 10.0       | 9.2-10.8  | 18         | 8            |
| Strategic Weapons Systems Electronics (SWSE) | 9.9        | 9.2-10.3  | 57         | 32           |
| Machinery Repairman (MR)                     | <u>8.1</u> | 7.1- 9.3  | 25         | 11           |
| Overall Mean                                 | 10.6       |           |            |              |

\*For year ending 31 August 1982. Data provided by CNET, Code N-2.

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TABLE 3. READING ABILITY\* OF NAVAL RECRUITS (FY 82)

| Grade Level Range | Number | Percentage |
|-------------------|--------|------------|
| Above 12.0        | 25,536 | 32.3       |
| 10.1-12.0         | 22,986 | 29.1       |
| 8.1-10.0          | 14,707 | 18.6       |
| 6.1-8.0           | 12,896 | 16.5       |
| 4.1-6.0           | 2,539  | 3.2        |
| Below 4.0         | 390    | .5         |
| <hr/>             |        |            |
| Median = 10.9     | 79,054 |            |
| Mean = 9.8        |        |            |

\*Reading scores were obtained from the CMI Recruit Population Analysis Report produced by the Management Information and Instructional Systems Activity (MIISA).

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**SECTION IV**  
**CONCLUSIONS AND RECOMMENDATIONS**

**CONCLUSIONS**

The overall mean readability grade level of the school curricula sampled was 10.6. Comparing this to FY 82 figures on the average reading ability level of Navy recruits ( $\bar{X} = 9.8$ , median = 10.9, see table 3) there would appear to be a match between readability grade level and reading grade level for courses sampled. However, difficulty range of the materials sampled varied widely within courses. Certain curriculum materials had readability grade levels considerably higher than the reading ability of the intended users.

The fact that mean readability grade level of the 11 sampled courses correlated positively with setback rates indicates that readability may be contributing to the setback problem. This appears to be particularly true of those schools which embody high technology (e.g., Electronics Technician "A" School and Advanced First Term Avionics School).

An examination of the curriculum materials used in the highly technical schools revealed the frequent use of many difficult technical words, required by the subject matter. The CRES analysis which calculates readability grade level also flags uncommon words. Many of these uncommon words are technical words (e.g., gyrocompass) which have no substitute. Therefore, a supplemental list must be constructed for use with specialized materials. Appendix B presents an example of such a list for the Strategic Weapons Systems Electronics "A" School. A list like this is a tool for producing glossaries and vocabulary exercises for Navy technical school students needing reading instruction specific to the course. The production of such materials is likely to be an important part of carrying out the requirements contained in OPNAVINST 1510.11.

It should be noted that readability is just one measure of the comprehensibility of textual material. Other factors of comprehensibility such as content, vocabulary, sentence structure, and format are not addressed by readability formulas. Nevertheless, a very high RGL, such as 16 or above, is indicative of a problem, and thus signifies a need for simplifying the material. The CRES is one aid for improving not just readability but comprehensibility (e.g., vocabulary, sentence construction, test item format).

**RECOMMENDATIONS**

1. In accordance with OPNAVINST 1510.11 which gives CNET the responsibility to set readability and/or comprehensibility standards, the following are recommended:

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- set readability grade level standards to match the mean reading ability of the intended reader when curriculum material is being written or revised
- use Gates-MacGinitie reading test results as one measure to derive target readability grade level requirements for particular schools
- use the CRES or the manual method prescribed by DOD specification MIL-M-38784A, Amendment 6, to assess readability grade level of curriculum material
- use the CRES to improve the comprehensibility of Navy curriculum material.

2. Develop glossaries, wherever appropriate, particularly for highly technical curriculum materials. Although most Navy schools now have glossaries, increased emphasis should be placed on their development and use. The CRES is a good tool for developing glossaries and should be used where available for this purpose.

3. Select additional courses for readability analysis based on the strategy for prioritization described in this study. Analyze the curricula of these courses as resources permit. In accordance with this recommendation, the CNET should task an appropriate organization for a programmatic effort. It is anticipated that several man-years would be required for analysis of remaining "A" schools.

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**APPENDIX A**

**READABILITY GRADE LEVEL OF SAMPLED MATERIALS**

The following are readability grade levels for each document analyzed for the school cited in section II of this report.

**AIR TRAFFIC CONTROLLERS "A" SCHOOL**

| <u>Title</u>                    | <u>Number</u>                              | <u>RGL</u> |
|---------------------------------|--|------------|
| Charts and Publications         | Information Sheet 9.9.1I<br>CNTT-M1515     | 15.9       |
| USAF/USN NOTAMS                 | Information Sheet 9.4.1I                   | 14.2       |
| Time and Basic Navigation       | Information Sheet 9.5.1I<br>CNTT-M1483     | 6.6        |
| Search & Rescue                 | Information Sheet 9.6.1I<br>CNTT-M1485     | 9.9        |
| Air Traffic Control Procedures  | Information Sheet<br>OPNAV 3710.7 Excerpts | 12.1       |
| Airport Facilities and Lighting | Information Sheet 9.12.1I                  | 11.0       |
| ASR Approaches - Part I         | CNTT-M1139                                 | 13.1       |
| ASR Approaches - Part II        | CNTT-1135                                  | 8.9        |
| ATC Radar - Part I (ASR)        | CNTT-M1071                                 | 11.0       |
| Basic Radar Theory              | CNTT-G87                                   | 8.5        |
| Aviation Weather                | CNTT-M1110                                 | 10.1       |
| NavAids                         | CNTT-1338                                  | 11.1       |
| Base Operations Laboratory      | -----                                      | 9.3        |
| Terminal Facility Equipment     | CNTT-M1516                                 | 10.1       |
| Control Tower Operator          | CNTT-M1239                                 | 11.7       |
| Overall                         |  | 10.9       |

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AVIATION ELECTRONICS MATE "A" SCHOOL

| <u>Title</u>   | <u>Number</u>    | <u>RGL</u> |
|--|------------------|------------|
| Positive and Negative Numbers                                  | CNATT-M25        | 8.1        |
| Fractions (Basic Math)   | CNATT-P-4968     | 6.4        |
| Powers of Ten  | CNTT-M707        | 11.0       |
| Magnetism  | CNATT-M544       | 10.3       |
| Magnetic Theory  | CNATT-M154       | 11.2       |
| Aircraft Wiring Practices and Basic Electrical Troubleshooting | CNTT-M1012       | 9.6        |
| Basic Electronic Circuits                                      | CNTT-M971        | 10.5       |
| Aviation Electrician's Mate                                    | NAVEDTRA 10348-D | 12.2       |
| Overall  | 10.3             |            |

ADVANCED FIRST TERM AVIONICS COURSE (AFTA) SCHOOL

| <u>Title</u>                        | <u>Number</u> | <u>RGL</u> |
|-------------------------------------|---------------|------------|
| Trainee Workbook, Phase IV, Unit 1  | CNTT-M491     | 11.8       |
| Trainee Workbook, Phase III, Unit 2 | CNTT-M488     | 11.7       |
| Trainee Workbook, Phase III, Unit 1 | CNTT-M542     | 11.5       |
| Trainee Workbook, Unit 2            | CNTT-M1463    | 12.0       |
| Overall                             | 11.9          |            |

AEROGRAPHER'S MATE "A" SCHOOL

| <u>Title</u>   | <u>Number</u>       | <u>RGL</u> |
|--|---------------------|------------|
| Decoding & Plotting of the International Analysis Code             | CNTT-L186           | 8.1        |
| Decoding RadFo Messages and Plotting Radiological Fallout Diagrams | 3ABR25130-2-PT-305J | 7.2        |
| The APT Predict Message and Tracking Board                         | 3ABR25130-2-PT-407A | 6.7        |

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AEROGRAPHER'S MATE "A" SCHOOL (continued)

| <u>Title</u>                                 | <u>Number</u>       | <u>RGL</u> |
|--|---------------------|------------|
| Skew T, Log P Diagram                        | 3ABR25130-2-PT-408A | 5.8        |
| Pilot Reports (PiRep Code)                   | 3ABR25130-SG-112    | 8.7        |
| Cloud Forms                                  | 3ABR25130-WB-104B   | 8.2        |
| Types of Observations                        | 3ABR25130-WB-110    | 8.0        |
| Oceanic Circulation                          | CNATT-L129          | 9.4        |
| Sound Ray Theory                             | CNATT-L131          | 8.7        |
| Basic Principles of Sea and Swell            | CNTT-L149           | 8.7        |
| Meteorological Satellite Terms and Equipment | 3ABR25130-2-PT-308A | 8.4        |
| Properties of Sea Water                      | 3ABR25130-2-PT-401  | 10.9       |
| Aerographer's Mate 3 & 2                     | NAVEDTRA 10363-E    | 9.6        |
| Weather for Aircrews                         | AFM 51-12           | 11.4       |
| Federal Meteorological Handbook              | FMH-1B              | 11.8       |
| Surface Synoptic Codes                       | FMH-2               | 8.2        |
| Overall                                      | 10.0                |            |

AVIONICS (AQ,AT,AX) "A" SCHOOL

| <u>Title</u>   | <u>Number</u> | <u>RGL</u> |
|--|---------------|------------|
| Introduction to AM Communications Unit 1, Module 1, Volume III | CNTT-M1311    | 11.3       |
| Introduction to AM Communications Unit 1, Module 1, Volume II  | CNTT-M1314    | 10.8       |
| Overall  | 11.0          |            |

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AVIATION ANTISUBMARINE WARFARE OPERATOR "A" SCHOOL

| <u>Title</u>                              | <u>Number</u> | <u>RGL</u> |
|---|---------------|------------|
| AW(A1) Prerequisite Mathematics           | CNTT-M1178    | 9.4        |
| Students' Guide, Vol. 1,<br>Phases I & II | CNTT-M1184    | 12.1       |
| Overall                                   |               | 10.6       |

DATA SYSTEMS TECHNICIAN "A" SCHOOL

| <u>Title</u>                           | <u>Number</u> | <u>RGL</u> |
|--|---------------|------------|
| Trainee's Guide for the<br>COMTRAN TEN | -----         | 10.2       |
| Learner's Guide, Vol. I                | PX-10773-1    | 9.7        |
| Learner's Guide, Vol. II               | PX-10773-2    | 10.8       |
| Trainee's Guide, Phase A-1             | -----         | 9.2        |
| Overall                                |               | 10.0       |

ELECTRONICS TECHNICIAN "A" SCHOOL

| <u>Title</u>                                 | <u>Number</u> | <u>RGL</u> |
|--|---------------|------------|
| Telecommunication Systems                    | ET/A-18691    | 13.1       |
| Radar (AN/SPS-10)                            | ET/A-18093    | 11.9       |
| Advanced Electronics and<br>Circuit Analysis | ET/A-18465    | 13.0       |
| Overall                                      |               | 12.6       |

MINEMAN "A" SCHOOL

| <u>Title</u>          | <u>Number</u> | <u>RGL</u> |
|-----------------------|---------------|------------|
| Student Guide, Unit 2 | -----         | 10.6       |
| Student Guide, Unit 3 | -----         | 9.4        |
| Student Guide, Unit 6 | -----         | 11.2       |

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MINEMAN "A" SCHOOL (continued)

| <u>Title</u>          | <u>Number</u>          | <u>RGL</u> |
|-----------------------|------------------------|------------|
| Student Guide, Unit 7 | -----                  | 9.1        |
| Student Guide, Unit 8 | -----                  | 9.7        |
| Technical Manual      | NAVSEA OP 3504, Vol. 1 | 13.4       |
| Technical Manual      | NAVSEA OP 4410, Vol. 5 | 10.7       |
| Technical Manual      | NAVSEA OP 4410, Vol. 1 | 14.4       |
| Technical Manual      | NAVSEA OP 2572         | 13.4       |
| Technical Manual      | NAVSEA OP 3529         | 11.5       |
| Overall               | 11.3                   |            |

MACHINERY REPAIRMAN "A" SCHOOL

| <u>Title</u>                      | <u>Number</u>    | <u>RGL</u> |
|-----------------------------------|------------------|------------|
| Student's Guide Volume 1, Phase 1 | -----            | 8.3        |
| Student's Guide Volume 1, Phase 2 | -----            | 8.2        |
| Student's Guide Volume 1, Phase 3 | -----            | 7.9        |
| Student's Guide Volume 1, Phase 4 | -----            | 8.5        |
| Student's Guide Volume 1, Phase 5 | -----            | 7.4        |
| Student's Guide Volume 1, Phase 6 | -----            | 7.1        |
| Machinery Repairman 3 & 2         | NAVEDTRA 10530-D | 9.3        |
| Overall                           | 8.1              |            |

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STRATEGIC WEAPONS SYSTEMS ELECTRONICS "A" SCHOOL

| <u>Title</u>                        | <u>Number</u>                                    | <u>RGL</u> |
|-------------------------------------|--|------------|
| Basic Digital Computer Fundamentals | NAVTECHTRA 121-0142<br>Rev. A, SSWB-BDC1, Vol. 2 | 9.8        |
| Inductance                          | 002/2-3-4  | 9.2        |
| Trainee Guide                       | NAVTECHTRA 121-0142<br>Rev. A, Vol. 1            | 10.3       |
| Overall                             | 9.9  |            |

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APPENDIX B

TECHNICAL WORDS IDENTIFIED BY CRES ANALYSIS

STRATEGIC WEAPONS SYSTEMS ELECTRONIC "A" SCHOOL

|                      |                  |
|----------------------|------------------|
| bit-by-bit           | repulsion        |
| CEMF                 | resolver         |
| coefficient          | representation   |
| counterelectromotive | repunched        |
| capacitive           | S1-S             |
| cathode-ray          | S2-S             |
| CCW                  | self-inductance  |
| CREO                 | self-synchronous |
| CW                   | synchros         |
| component            | sine-wave        |
| crystal-controlled   | sign-number      |
| comparator           | SSWB             |
| converter            | tp"A"            |
| digital              |                  |
| DMM                  |                  |
| DSflux               |                  |
| five-bit             |                  |
| flip-flop            |                  |
| four-bit             |                  |
| free-running         |                  |
| fractional           |                  |
| half-cycle           |                  |
| HZ                   |                  |
| inductive            |                  |
| inductor             |                  |
| inductosyn           |                  |
| inertia              |                  |
| KHZ                  |                  |
| Kirchhoff            |                  |
| K-F/F                |                  |
| lenz                 |                  |
| LSD                  |                  |
| microheneries        |                  |
| microsecond          |                  |
| misaligned           |                  |
| multivibrator        |                  |
| mylar                |                  |
| NMSD                 |                  |
| ODS                  |                  |
| OPS                  |                  |
| oscilloscope         |                  |
| over-range           |                  |
| permeability         |                  |
| pin-jacks            |                  |
| potentiometer        |                  |
| probe                |                  |

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